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REPORTS
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**Fire Suppression Costs on Large Fires
A Report on the Status of Measures to
Reduce Large Fire Costs**

Fire Suppression Costs on Large Fires

OVERSIGHT REPORT

A Report on the Status of
Measures to Reduce Large Fire
Costs

SEPTEMBER 10, 1996

Introduction

The 1994 fire season was one of the most severe in terms of **burned acreage, number of fires, lost firefighter lives, and suppression costs**. Concerns about high expenditures, \$757 million, were reported in "Fire Suppression Costs on Large Fires, A Review of the 1994 Fire Season (August 1, 1995)." The Deputy Chief for State and Private Forestry subsequently approved an action plan to implement key recommendations of the "Costs" report (see Appendix A). This report is the direct result of that action plan, i.e., activation of a National oversight team to review selected fires that exceed specific criteria in costs, duration, or complexity.

The 1996 Fire Season to date has exceeded the 1994 season in the number of fires and burned acreage. At the current rate of expenditure, the 1996 fire season will cost more than \$400 million yet will be significantly below the 1994 season. While the cost difference is due in part to extensive firefighting on non-federal lands, **application of cost reduction measures and increased oversight at all levels may account for a portion of this reduction.**

Conduct of the Review

The review team met at the National Headquarters in Washington, D.C., to decide the scope and objectives of the review (see Appendix A). The Team identified six fires, all in Region 6, from the Daily Situation report as high cost fires. The team then traveled to the National Forests on which these fires occurred and interviewed Regional and Forest fire management personnel, line officers, financial officers, and comptrollers. The **Office of Inspector General, U.S.D.A.**, had a representative attend the Willamette National Forest briefing. A copy of his trip report is included in Appendix I.

The six fires reviewed were:

South Zone Complex, Willamette National Forest

Moolack Complex, Willamette National Forest

North Umpqua Complex, Umpqua National Forest

Spring Fire, Umpqua National Forest

Tower Fire, Umatilla National Forest

Summit and Bull Fires, Umatilla national Forest

In addition, the team visited the Northwest Interagency Coordination Center and the National Interagency Fire Center (**NIFC**) in Boise, Idaho to follow up on cost and mobilization issues discussed during the Forests visits.

National Oversight Team Members

William McCleese Associate Deputy Chief, State and Private Forestry, National Headquarters

Harry Croft Assistant Director, Planning, Fire and Aviation Management, National Headquarters

William Bradshaw Fire Business Management Specialist, Fiscal and Accounting Services, National Headquarters

Many documents were collected during the review. The most pertinent documents to this report appear in the Appendix. Additional information on specific fires can be obtained at the Forest headquarters.

The Team did not question the tactics or the decisions made on any of the fires. The Team focused on those items identified in the Large Fire Cost Action Plan:

- the processes employed to reach fire suppression decisions
- oversight measures used by management
- documentation of strategies, alternative evaluation, and cost accountability.

EXECUTIVE SUMMARY

A National Oversight Team visited six large fires in Region 6, the Pacific Northwest Region, to determine the extent of implementation of cost reduction measures.

The fires selected all exhibited large total costs, ranging from \$5 million to \$15 million, and large unit costs, from \$230 per acre to \$3,800 per acre.

The Team found that there was a concerted effort to display, examine, and manage fire suppression costs on all six fires.

Strong and effective Regional leadership was evident in all instances. Cost control measures were in place and working. The close coordination and collaboration between National Incident Management Teams and Line Officers resulted in effective, safe, and cost conscious decision-making.

Concerns about availability of Type 2 crews continue to be a problem and are becoming a significant cost factor for firefighting.

The use and processes associated with the Escaped Fire Situation Analysis (EFSA) are vastly improved.

All six fires employed comptrollers to provide a strong management link between incident management teams and local agency administrators.

Cache and property control measures were also in place and well managed.

Type 1 helicopters are a high cost fire suppression tool. The Team found that usage was supported by cost analyses and proved to be a cost-effective strategy.

Three key problem areas still exist:

1. Inconsistent and confusing administration of the Rest and Recuperation (R&R) Policy.
2. Inequities in pay under Exempt/Non-exempt (FLSA) rules.
3. Inequities for charging meal costs for local firefighters.

Overall, cost reduction measures were found to be in place and working.

COMMENDATIONS

Line Officer Involvement - The Team observed excellent interaction between line officers at all levels and the fire managers to address fire cost issues.

Integration of Comptroller - Both the comptrollers and Finance Section Chiefs were actively working together to identify areas of concern, to take quick action to control costs, and to insure cost information was available to local line officers.

Regional Leadership - Regional Fire Staff and Regional Incident Business Management did an exemplary job of advising and coaching Forests and Incident Management Teams. Regional interest and oversight were clearly demonstrated.

Reevaluation of Alternatives - On those incidents visited, there was a demonstrated willingness to reassess strategic direction based on the availability of suppression resources.

Use of New Technology - The Region and IMTs made outstanding use of technology to evaluate risks (RERAP)¹ associated with multiple events and to identify and assess cost information (ICARS - Incident Cost & Reporting System.) In addition, The Region piloted the Smart Card project for improved incident accountability. The results of this pilot should result in better cost controls and less waste at incidents.

¹Rare Event Risk Assessment Process is a mathematical analysis to ascertain the probabilities of rare and significant spread events, a major source of risk in long duration fires.

FINDINGS

The team discussed many issues with many people. For the purposes of this report, only cost related issues are documented here.

Mobilization/Availability

Type 2 Crews - The shortage of qualified, capable regular FS crews (Type 2) continues to result in higher costs for alternative crews such as military or contract crews. Reduced production rates for fire line construction for many Type 2 crews ultimately resulted in increased costs due to less aggressive tactics adopted and the subsequent larger fire size.

Military Crews - Military crews cost approximately \$450,000 per incident. Costs billed to the Forest Service do not include salaries, overtime, or hazard pay. Only transportation costs, cost of boots¹, and basic support costs are charged to an incident. Military crews are well trained, disciplined, and perform well² on wildfires. Once mobilized, the marginal costs for keeping military crews on an incident are small and, as the period of assignment increases, become highly cost effective and competitive with costs for local Type 2 crews, although at a lesser capability.

Contract Crews - Contract crews usually come with all necessary equipment and incur all costs of employment, training, OWCP, etc. The performance of contract crews is widely varied, depending on the leadership, training, and experience of the crews. The State of Oregon administers the contract for these crews. In general, these crews cost more than Forest Service "regulars" and do not perform as well³ as the standard for Type 2 crews would dictate. Improved administration of the contracts and tighter screening for performance requirements would greatly improve this resource.

FS Type 2 Crews - Surprisingly, there was a wide spectrum of satisfaction with the performance of FS Type 2 crews. Several fire managers said that a Type 3 crew designation is needed. The benefits of using local crews are reduced mobilization costs,

¹Boots are provided to military personnel for safety reasons at a cost of \$103 per pair. Previous experiences with military boots resulted in many foot/leg injuries as well as boot replacement costs billed to the FS.

²Military crews only receive basic 32 hour firefighting training and as such are not given as difficult hot line assignments as would other Type 2 crews.

³Reports on performance were extremely varied, from adequate to less than satisfactory. In general, IC's did not think contract crews were an acceptable substitute for regular FS Type 2 crews.

closer control over performance requirements, and most significantly, improved initial attack capability. The latter benefit keeps the fire small at the outset and provides for increased extended attack capability. A side benefit for FS Type 2 crews is their availability for broader-based activities such as hazardous fuel reduction including prescribed burning⁴. Most Incident Commanders indicate a need for more "good" Type 2 crews as opposed to more Type 1, a.k.a. hotshot crews.

Hotshot Crews - Because of low production rates for some Type 2 crews, many fire managers requested Type 1 crews. Type 1 crews have high production rates, are highly disciplined and well organized, and are in top physical condition. Some IC's expressed negative feelings about Hotshot crews, which was characterized as "elitism." While this is not an incident cost factor⁵, it is important to note this problem.

Mobilization Costs - One of the more salient and subtle cost factors encountered by the Team was that of **low priority fires receiving higher cost resources**. For example, a low value, seemingly low risk wilderness fire was evaluated as low priority for receiving scarce resources.

For high priority fires, conscious decisions were made to turn away high cost resources, i.e., to seek out the best buy. Low priority fires, then, either received no resources at all or were forced to utilize whatever was left over regardless of cost. One logistics manager, on a high priority fire, reported that \$1,000 per day school buses⁶ were turned back in favor of \$350 a day buses. So while the high priority fire saved \$650 per day per bus, the lower priority fire was forced to pay the difference for these buses as they were the only transportation available!

Use of Escaped Fire Situation Analysis (EFSA)

All incidents used a detailed EFSA. A computerized version, developed by a private contractor, was most prevalent. While there are subtle changes and improvements possible in the computerized version, the EFSA's reviewed were well developed and demonstrated excellent coordination between the IC and the line officer to arrive at **cost-effective decisions that adequately considered firefighter safety**.

Fall back and worst case scenarios were developed and considered. High success alternatives were considered and selected.

⁴A broader based fire personnel cadre is an objective of **FIRE 21**.

⁵Type 1 crew availability costs are developed and planned as part of National presuppression planning for large fire support. There is some concern about increasing Type 1 crew costs as well as "elitism."

⁶Schoolbuses are frequently used to transport crews to and from the fire.

Forest Land Management Plan direction was reflected in resource considerations and constraints. Tactics were changed whenever a selected strategy was not successful. The **Region was instrumental in assisting the Forest in the development of these EFSA**s. EFSA s were revised as situations changed, often two or three times.

Only one incident used a handwritten, low technology, version of an EFSA. Since the incident included more than 90 separate fires, this was a practical solution for selecting a strategy to deal with all the variations. The low technology version did allow for the line officer to personalize the decisions with handwritten notes and comments. **The lack of ability to personalize an EFSA is the one potential flaw in the computerized version.** A computerized format tends to become an abstract, automatic process rather than a better decision-making tool to better evaluate many alternatives.

Cost Accountability

Comptrollers - All fires visited had comptrollers assigned. In addition the Region had assigned an experienced comptroller to assist and provide advice for fewer experienced comptrollers.

In general, the comptrollers had a good understanding of their responsibilities. There were differences in experience, overall emphasis, and effectiveness. This has been observed throughout the nation and is the basis for a scheduled Comptroller Workshop in March 1997.

There was an anecdote from an incident where a comptroller allegedly was concerned about the cost and allocation of candy bars⁷. The Team did not encounter any similar incidents on the fires visited. **Most comptrollers were involved with much more important cost issues such as equipment, contracting, and fire strategies.**

Smart Cards - The Team was briefed on a pilot project to use Smart Cards for tracking incident personnel, property, and meals. Based on the report, this appears to be a successful project that **should be expanded throughout the nation** to improve on-site property control, reduce waste, and improve accountability.

Cache and Property Control - At NIFC, the Team received a detailed briefing on property control. As a result of a prior year OGC audit, measures have been put in place over the last several years to provide better accounting and tracking of property,

⁷The cost of candy bars, bottled water, and other "supplemental" foods has been an anecdotal issue reported several times over the last several years. A cost per person analysis is contained in Appendix F which shows a cost of \$1 per person for supplemental foods, 4 1/100th of a percent.

including consumables, sent to incidents from fire caches. A field review was conducted this year to assess the success of the program and to assist the Regions. This year's review indicated a continuing improvement in returning non-consumable property. Results of the review are included in Appendix H.

Delegations of Authority - There is not widespread uniformity in Delegation of Authority letters. Some delegation letters were so general and vague as to be inoperable. In these instances, however, the line officer closely coordinated his direction with the IC to achieve the intended result. While the technique of drafting broad direction resulted in a successful plan which was well understood by the IC, generalized delegations have inherent weaknesses⁸ that could have resulted in significant failures.

Type 1 Helicopter Analyses - A major concern that has emerged over the years is the high cost versus productivity of heavy (Type 1) helicopters. On the incidents visited there was an analysis (see Appendix G) that reflected the cost effectiveness of these expensive firefighting resources. There were three key reasons that led to Type 1 helicopter use.

1. Short cycle times - in most cases the time between water drops was five minutes as compared to 20-30 minutes for a comparable airtanker.
2. Fire control effectiveness - The helicopters observed were dropping water in heavily timbered forests where the use of fixed winged aircraft would not be as efficient, cost-wise and fire extinguishment-wise, as the helicopters. Direct drops through the canopy proved a successful and effective strategy.
3. Using helicopters freed up fixed wing airtankers for initial attack. The fixed wing airtankers have greater speed and coverage for initial attack and proved more cost effective under these circumstances than to tie them up for large fire support.

Incident Cost Accounting Report System (ICARS) - All the incidents were using ICARS for tracking and displaying their costs (See Appendix F). The incident management teams used the ICARS reports to examine their cost centers, to isolate problems, and to provide the basis for better cost reduction measures. There is a need to upgrade the ICARS programming to a "Windows" environment.

⁸Shift changes, absentee line officer, and other command level personnel may result in different interpretations of the Delegations in the absence of close coordination with the line officer that was observed here.

Land Management Priorities -

Several fires were located inside designated wilderness or roadless areas. While the fire itself, i.e., the effects of the fire on resource values, was doing little harm, large costs were incurred to protect adjacent private land values, both resource and structural⁹ values.

The vegetative type in these wilderness areas was primarily a long interval, fire-adapted timber species. The only difference between a prescribed fire and a wildfire in this case was the ability to manage or confine it to the wilderness area boundaries. The large cost to keep the fire from burning outside the wilderness area was appropriate for two primary reasons:

1. The **values to be protected** outside the wilderness were significant and **justified greater expense** to control.
2. The **wilderness areas were too small** to allow greater tolerance and latitude in the risk of managing as a prescribed fire, i.e., to use a less costly option.

Regional Oversight Performance

The Region has done an excellent job of providing oversight to reduce large fire costs.

- There was strong direction from the Regional Forester (See Appendix B) building on the National direction.
- Preparedness reviews insured understanding of national issues and concerns.
- Experienced fire managers were provided to those Forests with less experienced fire staff.
- Cost reduction assessment teams were formed and operating. The Region varied the national direction due to the number of simultaneous fire events, but still provided adequate coverage to meet the objectives.
- The Regional Fire Business Coordinator and Regional Fire Management personnel were actively involved in large fire decision-making.
- Regional and Forest line officers were actively engaged and visible in their efforts to manage costs during emergency situations.

⁹Structural values included homes, powerlines, and micro-wave sites.

Miscellaneous

Rest and Recuperation (R&R) Policy - There appears to be much confusion in the application and interpretations concerning R&R. In either case production was lost, fires got bigger, and ultimately, cost more to suppress.

IC's did not know how many days individuals or crews had left to work before mandatory R&R. Thus, they were unable to participate in decisions to accept resources that could only work one or two shifts.

This became a cost issue when crews were dispatched long distances only to be used for a couple of days and either released to travel back home in the case of a hotshot crew, or placed on R&R locally.

Exempt/Non-Exempt - The availability of personnel to fill key fire management positions is seriously impacted by the Exempt/Non-Exempt rules for pay purposes. In many cases, highly qualified personnel (for fire overhead positions) will not work on fires because their overtime pay¹⁰ is less than they normally earn in straight pay status. Similarly, those that do work, do so at lesser skill positions that are exempt. In this case, a person makes more money driving a pickup than they would as a Plans Chief. Higher costs are incurred mobilizing, in some cases transporting personnel across the country to fill jobs where pay is constraining efficient position management.

Meals for Local Firefighters - The Team heard several instances where there is a perceived inequity in the treatment of local firefighters vs non-local firefighters. While seemingly trivial in the context of fire cost issues, it is having a significant negative effect on the morale of local firefighters.

Specifically, the government can provide meals to personnel at an incident command post (ICP) even if on the employees' own District because it is the most efficient way to provide food under the circumstances. USDA grants the FS a waiver from the requirement that locals be in travel status for government provided meals as long as they stay at the ICP.

On the other hand, local firefighters who return home at night cannot be provided meals unless the meal value is deducted from their salary. This is because they are not in travel status off their unit. There are two cases of perceived inequity:

1. For local firefighters dispatched for initial attack in the afternoon, and for work until midnight; they have no access to food at the normal dinner hour. Yet, if the FS

¹⁰Non-Exempt pay rate is 1.5 times the rate of a GS-10, Step 1; therefore, a GS-12 on fire overtime in an exempt position is actually making less than he/she would if non-exempt.

delivers meals to these employees, the meal value must deducted from salary.

2. If local employees support the incident throughout long days, 12-14 hours shifts or longer, but return at night, any meal consumed at the ICP from the caterer or on the line (where everyone is eating) must also have the meal value deducted from the local employees' salary. This is not true of any of the other employees staying at the ICP or on the line.

In both cases, **management is asking the employees to work when and where they cannot access food for normal daily meals in an emergency situation.** The cost of providing meals in these situations is truly marginal to the total incident cost. Deducting meal cost is a major morale problem in these type of situations that reflects poor treatment by their employer, appears petty, and is outright inhospitable.

Incident Commanders should have the authority to waive these charges for meals under circumstances such as those described to insure they are properly rested and available for the next days assignment. The Team suspects that some ICs look the other way and don't charge for the meals, which only increases the inequity for those that are charged.

The current rules in the Interagency Incident Business Management Handbook represent strict interpretations of rules on providing food to employees in travel status and do not adequately reflect the nature of emergency wildland firefighting.

CONCLUSIONS

The cost of wildland firefighting is expensive and has been increasing over the last several years¹¹. There are several theories as to the reasons for this, some of which include drought, changed burning conditions, changed tactics, inflation, vegetative changes, etc.

Whatever the primary reasons for the increased costs, the agency has adopted a strategy to reduce these costs wherever possible. This report documents actions that have been implemented to reduce costs and still provide effective fire suppression.

¹¹See "Course to the Future - Positioning Fire and Aviation Management" and "Fire Suppression Costs on Large Fires."

Sommer

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Department of Service Office P.O. Box 96090
Agriculture** Washington, DC 20090-6090

Reply To : 5100/6500

Date: OCT 03 1996

Subject: Oversight Report on Large Fire Costs

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To: Chief, Associate Chief, Deputy Chiefs, Regional Foresters and Area Director

On September 5, 1996, I activated the National Fire Oversight Team to evaluate large fire activity in terms of cost and resource effectiveness. Enclosed is the Oversight Report: A Report on the Status of Measures to Reduce Large Fire Costs which was completed on September 10. Due to the large size, a copy of the Appendix will only be sent out upon request from the F&AM staff.

This team monitored six fires, all in Region 6, which had high cost suppression strategies, projected long-term containment dates, and a high commitment of aviation resources. They focused on items identified in the 1996 Large Fire Cost Action Plan, including processes, oversight measures, and documentation to determine the extent of implementation of cost reduction measures. Several key issues were identified that we will be pursuing in the upcoming months.

Overall, I am extremely pleased with the leadership and the management of large fire costs displayed by the Pacific Northwest Regional Management Team and Regional Fire staff. We encourage you to use this report to identify areas where additional effort needs to be placed to ensure that wildfire suppression activities are managed in a cost effective manner.

Joan M. Comanor

JOAN M. COMANOR
Deputy Chief for State
and Private Forestry

Enclosure

Caring for the Land and Serving People

